What is claimed is:

1. An encoding apparatus for encoding a data which comprises a plurality of block data including a plurality of element data which are sequentially transferred in a form of a data stream, the encoding apparatus comprising a plurality of signal processing devices connected by a signal transfer means on which said data is transferred, each signal processing device comprising:

an encoding means for encoding a block data including a plurality of element data on the signal transfer means; and

a variable length coding means for carrying out a variable length coding of said encoded block data and outputting the variable length coded data via said signal transfer means in accordance with the data stream.

2. An encoding apparatus as set forth in claim 1, wherein each of said variable length coding means of said plurality of signal processing devices detects when the encoded data of the previous block data in said data stream has been subjected to variable length coding for the encoded data of the current block data encoded in that signal processing device and starts the variable length coding for the current encoded data after the substantial end of that variable length coding.

3. An encoding apparatus as set forth in claim 2,

wherein:

said data stream is image data,

each of said encoding means of said plurality of signal processing devices carries out said encoding for every block image data of a predetermined plurality of block image data obtained by dividing said image data, and

each of said variable length coding means of said plurality of signal processing devices carries out variable length coding on the encoded data for every said block image data in a predetermined order based on the arrangement of the block image data on said image data.

A3 contd

4. An encoding apparatus as set forth in claim 3, wherein

each of said encoding means of said plurality of signal processing devices comprises;

a motion compensation predicting means for selectively carrying out motion compensation prediction by referring to a reference image for every predetermined block image data of said image data,

a transform means for carrying out a predetermined transform with respect to pixel data of a result of said motion compensation prediction or original pixel data,

a quantizing means for quantizing the data

for every said block image data subjected to said transform, and

a local decoding means for decoding the data for every said quantized block image data to generate the reference image to be supplied to said motion compensation predicting means, and

each of said variable length coding means of said plurality of signal processing devices carries out variable length coding on the data for every said quantized block image data.

A3 cont'd

5. An encoding apparatus as set forth in claim 4, wherein said block image data is the image data for every macroblock.

6. An encoding apparatus as set forth in claim 4, wherein said transform means of each of said encoding means carries out processing including an orthogonal transform including any of a discrete cosine transform (DCT), a Fourier transform, a Hadamard transform, and a K-L transform.

7. An encoding method for encoding a data stream having a plurality of element data, comprising the steps of:

dividing said data stream into a predetermined plurality of block data;

successively allotting said divided plurality

of block data to a plurality of signal processing devices;

encoding said allotted block data based on a predetermined method in each of said plurality of signal processing devices;

successively carrying out variable length coding on the encoded data in the same signal processing devices as those for the encoding so that the encoded data for every said block data encoded in said plurality of signal processing devices are successively subjected to the variable length coding according to the order in said data stream; and

successively allotting new block data to the signal processing devices for which said variable length coding is ended.

A3, contd

8. An encoding method as set forth in claim 7, wherein each of said plurality of signal processing devices detects when the encoded data of the previous block data in said data stream has been subjected to variable length coding for the encoded data of the current block data encoded at that signal processing device and starts the variable length coding of the current encoded data after that variable length coding has substantially ended.

9. An encoding method as set forth in claim 8,

wherein

said data stream is image data,

said image data is divided into a predetermined plurality of block image data,

said divided plurality of block image data are successively allotted to a plurality of signal processing devices,

in each of said plurality of signal processing devices,

motion compensation prediction is selectively carried out for every said allotted block image data by referring to a reference image,

a predetermined transform is carried out with respect to the block image data of the result of said motion compensation prediction or original block image data,

the data for every said block image data subjected to said transform is quantized,

the end of the variable length coding with respect to the previous block image data in said image data for the current block image data is detected,

said quantized data are subjected to the variable length coding after the variable length coding with respect to said previous block image data is substantially ended to generate the block image data

subjected to the variable length coding,

said quantized block image data are decoded to generate the reference image to be supplied to said motion compensation prediction

new block image data is successively allotted with respect to said signal processing devices for which said variable length coding has ended.

A3 cont'd

10. A decoding apparatus for decoding encoded and variable length coded data which comprises a plurality of block data including a plurality of element data in a form of a data stream, the decoding apparatus comprising a plurality of signal processing devices, each of the signal processing devices comprising:

a variable length decoding means for successively carrying out variable length decoding on variable length coded block data in accordance with the data stream; and

a decoding means for decoding said variable length decoded block data.

11. A decoding apparatus as set forth in claim 10, wherein each of said variable length decoding means of said plurality of signal processing devices detects a timing of which the variable length coded data of the previous block data in said data stream has been subjected to the variable length decoding for the

variable length coded data for the current block data and starts the variable length decoding of the current variable length coded data after the previous variable length decoding has substantially ended.

12. A decoding apparatus as set forth in claim 11,

further comprising an allotting means for sequentially allotting the variable length coded data for every said block data of said encoded data stream to said plurality of signal processing devices, and

wherein each of said variable length decoding means of said plurality of signal processing devices starts the variable length decoding processing at said timing for the variable length coded data for every said block data allotted by said allotting means,

wherein each of said decoding means of said plurality of signal processing devices subsequently carries out the decoding of the related variable length decoded data after the end of the variable length decoding of the variable length coded data for every block data in said variable length decoding means of the same signal processing device, and

wherein said allotting means allots variable length coded data for every new block data to the signal processing devices for which said decoding is ended.

13. A decoding apparatus as set forth in claim 11,

wherein

said encoded data stream is a variable length coded image data stream obtained by encoding image data for every predetermined block image data and further carrying out variable length coding,

each of the variable length decoding means of said plurality of signal processing devices successively carries out variable length decoding on the variable length coded image data for every allotted block image data, and

each of the decoding means of said plurality of signal processing devices decodes the encoded image data for every said block image data subjected to the variable length decoding in said variable length decoding means of the same signal processing device.

14. A decoding apparatus as set forth in claim 13, wherein

each of decoding means of said plurality of signal processing devices comprises

an inverse quantizing means for inverse quantizing the encoded image data for every block image data obtained by variable length decoding of said variable length coded image data,

an inverse transform means for carrying out an inverse transform for the predetermined transform

with respect to said inverse quantized data,

an image data generating means for generating the original image data by referring to the reference image according to need based on the data for every said block image data subjected to said inverse transform, and

A3 contd

a motion compensation processing means for carrying out motion compensation processing based on the data for every said block image data subjected to said inverse transform or said original block image data generated according to need to generate said reference image.

15. A decoding apparatus as set forth in claim 14, wherein said block image data is the image data for every macroblock.

16. A decoding apparatus as set forth in claim 14, wherein said inverse transform means of each of said plurality of decoding means carries out the inverse transform of the orthogonal transform including any of discrete cosine transform (DCT), Fourier transform, Hadamard transform, and K-L transform.

17. A decoding method for decoding a variable length coded data stream obtained by encoding a data stream having a plurality of element data for every predetermined block data and further carrying out

variable length coding, comprising the steps of:

successively allotting the variable length coded data for every said block data successively arranged in said variable length coded data stream to a plurality of signal processing devices;

successively carrying out variable length decoding on the variable length coded data for every allotted block data so that the variable length decoding carried out in the plurality of signal processing devices is successively carried out according to the order of said block data in said data stream in each of said plurality of signal processing devices;

decoding the encoded data for every said block image data subjected to said variable length decoding in the same signal processing device in each of said plurality of signal processing devices; and

allotting variable length coded data of new block data to be decoded next to said signal processing devices for which said decoding is ended.

18. A decoding method as set forth in claim 17, wherein each of said plurality of signal processing devices detects when the variable length coded data of the previous block data in said data stream has been subjected to variable length decoding for the variable length coded data for every allotted block data and

starts the variable length decoding of that variable length coded data after that variable length decoding is substantially ended.

19. A decoding method as set forth in claim 18, wherein

said variable length coded data stream is variable length coded image data obtained by encoding image data for every predetermined block image data and further carrying out variable length coding,

the variable length coded image data for every block image data successively arranged in said variable length coded image data is successively allotted to a plurality of signal processing devices,

in each of said plurality of signal processing devices,

the variable length coded image data for every allotted block image data is subjected to variable length decoding,

the encoded image data for every variable length decoded block image data is inversely quantized,

the inverse transform of the predetermined transform is carried out with respect to said inversely quantized data,

the original block image data is generated by referring to a reference image according to need based

on the data for every block image data for which said inverse transform was carried out, and

motion compensation processing is carried out based on the data for every said block image data for which said inverse transform was carried out or said data generated according to need to generate said reference image.

A3 cancl.